CLAIMS

We claim:

1. An apparatus for supercritical processing of a workpiece comprising:

a. a transfer module having an entrance;

b. a supercritical processing module coupled to the transfer module;

c. a non-supercritical processing module coupled to the transfer module; and

d. a transfer mechanism coupled to the transfer module, the transfer mechanism configured to move the workpiece between the entrance, the supercritical processing module, and the non-supercritical processing module.

2. The apparatus of claim 1 wherein the entrance of the transfer module comprises a hand-off station.

3. The apparatus of claim 2 wherein the entrance of the transfer module further comprises an additional hand-off station.

4. The apparatus of claim 1 wherein the transfer module operates in vacuum and further wherein the entrance of the transfer module comprises a loadlock.

5. The apparatus of claim 4 wherein the entrance of the transfer module further comprises an additional loadlock.

6. The apparatus of claim 1 wherein the non-supercritical processing module comprises a semiconductor processing module.

7. The apparatus of claim 6 wherein the semiconductor processing module is selected from the group consisting of an etch module, a physical vapor deposition module, a chemical vapor deposition module, an electroplating module, a chemical mechanical planarization module, a photolithography module, and an

other semiconductor processing module.

8. The apparatus of claim 1 wherein the transfer mechanism comprises a robot.

9. The apparatus of claim 8 wherein the transfer module comprises a circular configuration.

10. The apparatus of claim 9 wherein the robot comprises a central robot, the central robot occupying a center of the circular configuration.

11. The apparatus of claim 8 wherein the transfer module comprises a track configuration.

12. The apparatus of claim 11 wherein the robot comprises a tracked robot, the tracked robot comprising the robot coupled to a track such that the robot moves along the track in order to reach the supercritical processing module and the non-supercritical processing module located along the track.

13. The apparatus of claim 8 wherein the robot comprises an extendable arm and an end effector.

14. The apparatus of claim 13 wherein the robot further comprises an additional arm and an additional end effector.

15. The apparatus of claim 1 wherein the first supercritical processing module comprises a pressure vessel.

16. The apparatus of claim 15 wherein the pressure vessel comprises a workpiece cavity and a pressure vessel entrance, the workpiece cavity holding the workpiece during supercritical processing, the pressure vessel entrance providing ingress and egress for the workpiece.

17. The apparatus of claim 16 wherein the transfer mechanism is configured to place the workpiece in the workpiece cavity.

18. The apparatus of claim 16 further comprising an ante-chamber coupling the transfer module and the supercritical processing module.

19. The apparatus of claim 1 further comprising means for pressurizing the supercritical processing module.

20. The apparatus of claim 19 wherein the means for pressurizing comprises a CO_2 pressurizing configuration which comprises a CO_2 supply vessel coupled to a pump which is coupled to the supercritical processing module.

21. The apparatus of claim 18 further comprising means for sealing, the means for sealing operable to seal the pressure vessel entrance.

22. The apparatus of claim 1 wherein the transfer module further comprises means for producing a vacuum within the transfer module.

23. The apparatus of claim 1 wherein the transfer module further comprises means for maintaining a slight positive pressure in the transfer module relative to a surrounding environment.

24. The apparatus of claim 23 wherein the means for maintaining the slight positive pressure in the transfer module comprise an inert gas injection arrangement.

25. The apparatus of claim 1 further comprising means for controlling such that the means for controlling directs the transfer mechanism to move the workpiece.

26. A method of supercritical processing a workpiece comprising the steps of:

a. transferring the workpiece from an entrance of a transfer module

into a transfer module;

b. transferring the workpiece to a supercritical processing module;

c. processing the workpiece in the supercritical processing module;

d. transferring the first workpiece to the non-supercritical processing module;

e. processing the workpiece in the non-supercritical processing module; and

f. returning the workpiece to the entrance of the transfer module.

27. The method of claim 26 wherein the entrance of the transfer module comprises a hand-off station.

28. The method of claim 27 wherein the entrance of the transfer module further comprises an additional hand-off station.

29. An apparatus for supercritical processing a workpiece comprising:

a. means for transferring the workpiece configured to transfer the workpiece into a transfer module;

b. means for supercritical processing configured such that in operation the means for transferring transfers the workpiece to the means for supercritical processing and further such that in operation the means for supercritical processing processes the workpiece; and

c. means for non-supercritical processing configured such that in operation the means for transferring transfers the workpiece to the means for non-supercritical processing and further such that in operation the means for non-supercritical processing processes the workpiece.

30. An apparatus for supercritical processing of a workpiece comprising:

a. a hand-off station;

b. a supercritical processing module coupled to the hand-off station;

c. a non-supercritical processing module coupled to the hand-off station; and

d. a transfer mechanism coupled to the hand-off station, the transfer

mechanism configured to move the workpiece between the entrance, the supercritical processing module, and the non-supercritical processing module.